

What is claimed is:

1. A method for securing ventilation cloth to a screen frame, comprising the steps of:
 - (a) orienting a screen frame in an approximately vertical position, the screen frame having a plurality of segments, each segment having a mounting surface on a face thereof, at least one of said segments having adhesive on the mounting surface thereof;
 - (b) hanging a ventilation cloth across the mounting surface of said one segment;
 - (c) providing adhesive in said at least one of the segments;
 - (d) inserting the ventilation cloth in the adhesive across a length of said one of the segments.
2. The method of claim 1, wherein step (c) includes melting the adhesive.
3. The method of claim 2, wherein:
 - each of the segments has adhesive on the mounting surface thereof;
 - step (b) includes hanging the ventilation cloth across the mounting surface each segment simultaneously;
 - step (c) includes melting the adhesive on all of the segments; and
 - step (d) includes inserting the ventilation cloth in the adhesive across a length of each of the segments.
4. The method of claim 1, wherein step (a) includes orienting the frame in a position between 0 and 30 degrees from vertical.
5. The method of claim 1, wherein step (d) includes pushing the screen into the adhesive along said one side with an elongated insertion member.
6. The method of claim 1, further comprising the step of clamping the screen frame on four sides simultaneously, before step (b).

1 7. The method of claim 6, wherein the clamping step includes compressing the
2 frame from the outside on all four sides.

1 8. The method of claim 5, further comprising, before step (b), the step of loading the
2 frame into a side of an apparatus in which the insertion is performed.

1 9. A method for securing a ventilation cloth to a screen bar segment, comprising the
2 steps of:

3 (a) providing a screen bar segment having a mounting surface on a face
4 thereof, the segment having adhesive on the mounting surface;

5 (b) spreading the ventilation cloth across the mounting surface of the screen
6 bar segment;

7 (c) melting the adhesive;

8 (d) inserting the ventilation cloth into the adhesive with an elongated insertion
9 member that extends substantially across a length of the screen bar segment.

1 10. The method of claim 9, wherein step (d) is performed by moving the insertion
2 member in a single motion normal to the plane of the ventilation cloth.

1 11. The method of claim 9, further comprising:

2 applying a release coating to the plurality of elongated insertion member before
3 step (d).

1 12. The method of claim 9, wherein the screen bar segment is included in a screen
2 frame having at least three segments, the method further comprising orienting the screen
3 frame in an approximately vertical position before step (b).

1 13. The method of claim 12, wherein

2 each of the segments has adhesive on the mounting surface thereof;

3 step (b) includes hanging the ventilation cloth across the mounting surface each
4 segment simultaneously;

5 step (c) includes melting the adhesive on all of the segments; and
6 step (d) includes inserting the ventilation cloth in the adhesive substantially across
7 the length of each of the segments.

1 14. Ventilation cloth insertion apparatus, comprising:
2 a fixture that orients a screen frame in an approximately vertical position, the
3 screen frame having a plurality of segments, each segment having a mounting surface on
4 a face thereof, at least one of said segments having adhesive on the mounting surface
5 thereof; and
6 at least one insertion device that inserts a vertically positioned ventilation cloth in
7 the adhesive substantially across a length of said one of the segments.

1 15. The apparatus of claim 14, further comprising a hanger that hangs the ventilation
2 cloth across the mounting surface of said one segment.

1 16. The apparatus of claim 14, further comprising a heater that melts the adhesive in
2 said one of the segments.

1 17. The apparatus of claim 14, wherein each of the segments has adhesive on the
2 mounting surface thereof; the apparatus further comprising:
3 a hanger that hangs the ventilation cloth across the mounting surface each
4 segment simultaneously; and
5 a heater that melts the adhesive on all of the segments;
6 wherein the apparatus includes at least one insertion apparatus for each respective
7 segment of the frame, for inserting the ventilation cloth in the adhesive across the length
8 of each of the segments.

1 18. The apparatus of claim 14, wherein the fixture orients the frame in a position
2 between 0 and 30 degrees from vertical.

1 19. The apparatus of claim 14, wherein the insertion device is a band or elongated
2 insertion member extending substantially across the length of the segment.

1 20. The apparatus of claim 14, further comprising means for clamping the screen
2 frame on four sides simultaneously.

1 21. The apparatus of claim 20, wherein the clamping means includes means for
2 compressing the frame from the outside on all four sides.

1 22. The apparatus of claim 20, wherein the clamping means includes at least one
2 clamping device on a side of the apparatus, said at least one clamping device being
3 capable of movement in a direction normal to a plane in which the frame is positioned to
4 allow the frame to be loaded into the apparatus by way of the side on which said at least
5 one clamping device is located.

1 23. The apparatus of claim 14, wherein the fixture includes a fixed arm and three
2 movable arms, the movable arms being positionable for clamping frames having multiple
3 sizes between the fixed and movable arms.

1 24. The apparatus of claim 23, wherein one of the movable arms is movable in a first
2 direction parallel to a length thereof and movable in a second direction perpendicular to
3 the length thereof.

1 25. The apparatus of claim 23, wherein each movable arm is movable within a
2 respective pair of slidable yolks.

1 26. The apparatus of claim 23, wherein each arm is positioned substantially at the
2 same height, measured from a plane in which the ventilation cloth lies.

1 27. Ventilation cloth insertion apparatus, comprising:
2 a fixture that clamps a screen frame, the screen frame having a plurality of
3 segments, each segment having a mounting surface on a face thereof, at least one of said
4 segments having adhesive on the mounting surface thereof,

5 said fixture having a plurality of clamping arms, said clamping arms being
6 positionable so that each clamping arm clamps a respective side edge of a respective one
7 of the plurality of sides of the screen frame while attaching a ventilation cloth to the
8 screen frame, wherein each of the plurality of clamping arms is positioned at a common
9 height with respect to a plane in which the ventilation cloth is positioned;
10 at least one insertion device that inserts a ventilation cloth in the adhesive
11 substantially across a length of said one of the segments.

1 28. The apparatus of claim 27, wherein each clamping arm clamps a respective
2 outside edge of a respective one of the plurality of sides of the frame, the outside edges of
3 the screen frame being the edges of the segments that are furthest from a center of the
4 screen frame.

1 29. The apparatus of claim 27, further comprising a heater that melts the adhesive in
2 said one of the segments.

1 30. The apparatus of claim 27, wherein :
2 each of the segments has adhesive on the mounting surface thereof;
3 the heater melts the adhesive on all of the segments; and
4 the apparatus includes a plurality of insertion devices, each inserting the
5 ventilation cloth in the adhesive across a length of a respective one of the segments.

1 31. The apparatus of claim 27, wherein the apparatus includes four clamping arms
2 forming a rectangle, and three of the four clamping arms are movable with respect to a
3 remaining one of the arms.

1 32. The apparatus of claim 31, wherein one of the movable arms is movable in a first
2 direction parallel to a length thereof and movable in a second direction perpendicular to
3 the length thereof.

1 33. The apparatus of claim 31, wherein each movable arm is movable within a
2 respective pair of slidable yolks.

1 34. The apparatus of claim 27, further comprising an air actuated shield for protecting
2 a portion of the ventilation cloth adjacent to a corner key in at least one corner of the
3 screen frame.

1 35. The apparatus of claim 27, wherein at least one clamping arm is located on a side
2 of the apparatus and is capable of movement in a direction normal to a plane in which the
3 frame is positioned, to allow the frame to be loaded into the apparatus by way of the side
4 on which said at least one clamping arm is located.

1 36. A cart for transporting a frame, comprising:
2 an L-shaped bracket having a side and a bottom portion;
3 a plurality of clips that hold the frame on the side and bottom portion of the
4 bracket; and
5 a pivotally mounted finger having a first position parallel to the bracket for
6 loading the frame onto the clips and a second position normal to the bracket.

1 37. The cart of claim 36, further comprising an actuator, wherein the bracket is
2 mounted to the actuator.

1 38. The cart of claim 36, wherein the plurality of clips includes at least two clips on
2 the bottom portion of the bracket.

1 39. A method for forming an assembly from screen material and a first frame having
2 a plurality of side members, wherein the screen comes into fixative contact with the
3 adhesive, characterized in that:
4 adhesive is pre-heated on each side member of the first frame; and
5 the screen is pushed using a plurality of pins on each side member of the first
6 frame simultaneously.

1 40. The method of claim 39, wherein the frame is pre-heated in an oven to melt the
2 adhesive.

1 41. The method of claim 39, further comprising, between the pre-heating and pushing
2 steps, the steps of:

- 3 (1) placing the first frame on a first support at a first height;
4 (2) clamping the frame; and
5 (3) actuating a second support to support the screen at a second height different from
6 the first height.

1 42. The method of claim 41, wherein the frame has four side members, and step
2 includes:

- 3 (i) clamping the first side member of the frame;
4 (ii) measuring a position of a third side member of the frame opposite the first side
5 member;
6 (iii) automatically positioning an insertion device above the adhesive on the third side
7 member.

1 43. The method of claim 41, wherein the frame has four side members, the method
2 further comprising, before the spreading step, the steps of:

- 3 (1) placing the first and second side members of the frame on first and second fixed
4 frame supports;
5 (2) automatically sliding a movable frame support under the third side member of the
6 frame; and
7 (3) automatically compressing the fourth side member towards the second side
8 member with a movable clamping arm.

1 44. The method of claim 43, wherein the frame has an unknown size before step is
2 executed.

1 45. The method of claim 39, wherein the frame has four side members, and the
2 pushing step includes:

- 3 inserting the screen into the first and second side members with first and second
4 fixed location insertion devices;

5 inserting the screen into the third side member with a first movable insertion
6 device; and

7 inserting the screen into the fourth side member with a second movable insertion
8 device that is configured to accommodate the first movable insertion device regardless of
9 the positions of the first and second movable insertion devices.

1 46. The method of claim 39, wherein the plurality of pins are mounted on a plurality
2 of arms, at least one of the plurality of arms being movable, the method further
3 comprising moving the at least one movable arm after the pushing step, to form a second
4 screen assembly having a second frame, the second frame having a different size from the
5 first frame.

1 47. The method of claim 46, wherein half of the plurality of arms are fixed and half of
2 the plurality of arms are movable, each fixed arm being located opposite a respective
3 movable arm.

1 48. The method of claim 39, further comprising the steps of:
2 (c) cooling the adhesive proximate to the pins; and then
3 (d) removing the pins from the adhesive.

1 49. The method of claim 39, further comprising the step of cooling the pins before
2 pushing the screen with the pins.

1 50. The method of claim 39, further comprising the step of pre-cutting the screen
2 material to approximately a final installed size before performing the pushing step.